



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/998,735	11/30/2001	Mehrdad Ehsani	017575.0717	7030
5073	7590	11/04/2004	EXAMINER	
BAKER BOTTS L.L.P. 2001 ROSS AVENUE SUITE 600 DALLAS, TX 75201-2980			MC CLOUD, RENATA D	
			ART UNIT	PAPER NUMBER
			2837	

DATE MAILED: 11/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	09/998,735	EHSANI ET AL.
	<b>Examiner</b>	<b>Art Unit</b>
	Renata McCloud	2837

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 07/26/2004.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-49 and 51-59 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) 1,26-36,41-49 and 51-59 is/are allowed.
- 6) Claim(s) 2-5,9-13,18-20,22-24 and 37-39 is/are rejected.
- 7) Claim(s) 6-8,14-17,21,25 and 40 is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|  | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### ***Response to Amendment***

1. In response to the amendment filed 31 August 2004, the following has occurred:  
  
The 35 USC 112 rejection has been withdrawn by the examiner due to the changes made by the applicant.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 2-5, 9-13, 18-20, 22-24 37-39 are rejected under 35 U.S.C. 102(b) as being anticipated by MacMinn et al (US 4,933,620).

**Claim 2:** A method comprising generating by a computer (Col. 8: 20-21) a phase current profile by initializing one or more first profile parameters (Col. 5: 5-10, 54-60) defining at least a first portion of the phase current profile (Fig. 2A); determining whether a first performance criterion (Col. 5: 23-32; Col. 7:19-40,52-61) is satisfied based on operation of the switched reluctance motor drive using the phase current profile defined by the one or more first profile parameters (Col. 5: 54-60); and updating at least one of the one or more first profile parameters if the first performance criterion is not satisfied (Col. 5: 40-47, Col. 7:52-8:42); generating a phase current (Fig. 2C) according to the

phase current profile (Col. 5:48-53, Col. 8:36-58); and applying the phase current to the SR motor (Fig. 1A:10) (Also see claim 1).

**Claim 18:** A method comprising generating by a computer (Col. 8: 20-21) a phase current profile by initializing one or more first profile parameters (Col. 5: 5-10, 54-60) defining at least a first portion of the phase current profile (Fig. 2A); determining whether a first performance criterion (Col. 5: 23-32; Col. 7:19-40,52-61) is satisfied based on operation of the switched reluctance motor drive using the phase current profile defined by the one or more first profile parameters (Col. 5: 54-60); and updating at least one of the one or more first profile parameters if the first performance criterion is not satisfied (Col. 5: 40-47, Col. 7:52-8:42) (Also see claim 1).

**Claim 22:** A SR motor system comprising a SR motor (Fig. 1A: 10) and a phase current (Fig. 5: ix) applied to the SR motor, the phase current applied according to a phase current profile determined by: initializing one or more first profile parameters (Col. 5: 5-10, 54-60) defining at least a first portion of the phase current profile (Fig. 2A); determining whether a first performance criterion (Col. 5: 23-32; Col. 7:19-40,52-61) is satisfied based on operation of the switched reluctance motor drive using the phase current profile defined by the one or more first profile parameters (Col. 5: 54-60); and updating at least one of the one or more first profile parameters if the first performance criterion is not satisfied (Col. 5: 40-47, Col. 7:52-8:42) (Also see claim 1).

**Claim 37:** a control system for use in a SR motor, the system operable to determine a phase current profile for a phase current used in the motor, the profile determined by: initializing one or more first profile parameters (Col. 5: 5-10, 54-60)

defining at least a first portion of the phase current profile (Fig. 2A); determining whether a first performance criterion (Col. 5: 23-32; Col. 7:19-40,52-61) is satisfied based on operation of the switched reluctance motor drive using the phase current profile defined by the one or more first profile parameters (Col. 5: 54-60); and updating at least one of the one or more first profile parameters if the first performance criterion is not satisfied (Col. 5: 40-47, Col. 7:52-8:42) (Also see claim 1). .

**Claims 3, 19, 23 and 38:** the first profile parameters comprise a current turn-off instant (Fig. 2B: theta\_p; Col. 5: 32-37, 54-60) and one or more first profile components (Fig. 2A: LP, Lm, theta Cy; Col. 5:54-60), each first profile component defining a portion of the phase current profile (Fig. 2A).

**Claim 4:** the first profile components comprise a reference current profile (Fig.2B: 28, theta\_o) defining a portion of the phase current profile before the current turn-off instant (Fig. 2B: theta\_p; Col. 5: 32-37), and a current turn-off profile (Fig. 2B: 28, theta\_q) defining the portion of the phase current profile after the current turn-off instant.

**Claim 5:** the first performance criterion comprises a desire torque (Col. 5: 40-47).

**Claim 9:** approximating the phase current to the phase current profile (Col. 7: 62-8: 14)

**Claim 10:** approximating the phase current to the phase current profile by hysteresis control and hard chopping (Col. 6: 30-44)

**Claim 11:** determining whether a first performance criterion is satisfied comprises operating the SRM drive and empirically measuring a performance characteristic of the SRM drive (Col. 7:62-8: 17).

**Claim 12:** simulating operation of the SRM (Fig. 2c).

**Claim 13, 20, 24 and 39:** initializing a change parameter (Col. 6:1-16) related to one of the profile parameters (Col. 6: 1-16, current or speed) defining at least a first portion of the phase current profile (Fig. 2A); determining whether a first performance criterion (Col. 5: 23-32) is satisfied based on operation of the switched reluctance motor drive using the one or more first profile parameters (Col. 5: 23-40, 54-60); and updating at least one of the one or more first profile parameters if the first performance criterion is not satisfied (Col. 5: 40-47, Col. 7:52-8:42); generating a phase current (Fig. 2C) according to the phase current profile (Col. 5:48-53, Col. 8:36-58); and applying the phase current to the SR motor (Fig. 1A:10).

#### ***Allowable Subject Matter***

4. Claims 1,26-36, and 41-49,51-59 are allowed.

Claims 6-8,14-17, 21, 25, and 40 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

5. Applicant's arguments filed 26 July 2004 have been fully considered but they are not persuasive. In response to applicant's argument that MacMinn fails to teach determining whether a first performance criterion is satisfied based on operation of the SR motor drive using the phase current profile and updating at least one or more of the profile parameters if the performance criterion is not satisfied, applicant's claim language is broad and there is nothing in the language that precludes the examiner from reading MacMinn as meeting the claimed limitations. MacMinn teaches determining whether a first performance criterion is satisfied based on operation of the switched reluctance motor drive using the phase current profile defined by the one or more first profile parameters (Col. 5: 23-32; Col. 7:19-40,52-61 refers to a phase current reaching a reference value and Col. 5: 54-60 refers to the parameters that are used); and updating at least one of the one or more first profile parameters if the first performance criterion is not satisfied (Col. 5: 40-47, Col. 7:52-8:42, refers to adjusting the turn on angle, which is one of the profile parameters, if there is a difference between the positions representative of the turn on and turn off currents). There is nothing in claims 2, 18, 22, or 37 that refers to the profile parameters or the current being commanded as a result of speed voltage or torque. There is nothing in the claims that further limit the invention as to a type of performance criterion, or as to what "updating a profile parameter" means or involves.

***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Renata McCloud whose telephone number is (571) 272-2069. The examiner can normally be reached on Mon.- Fri. from 8 am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Martin can be reached on (571) 272-2800 ext. 4. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2837

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Renata McCloud  
Examiner  
Art Unit 2837

RDM



DAVID MARTIN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800